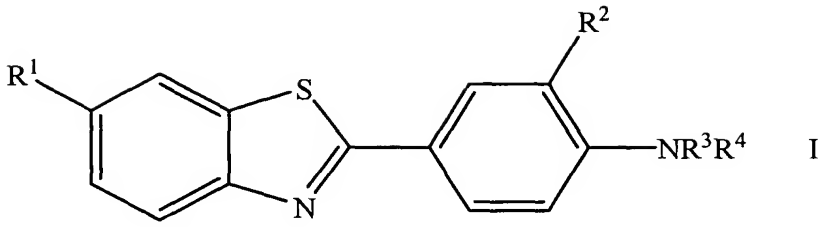
WE CLAIM:

1. A compound of formula I



I

or a pharmaceutically acceptable salt, hydrate, solvate or prodrug of the compound, wherein:

R^1 is hydrogen, -OH, $-NO_2$, -CN, -COOR, $-OCH_2OR$, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_1-C_6 alkoxy or halo;

R is C_1-C_6 alkyl;

R^2 is hydrogen, a non-radioactive halo or a radioactive halo;

R^3 is hydrogen, C_1-C_6 alkyl, C_2-C_6 alkenyl or C_2-C_6 alkynyl; and

R^4 is hydrogen, C_1-C_6 alkyl, C_2-C_6 alkenyl or C_2-C_6 alkynyl, wherein the alkyl, alkenyl or alkynyl comprises a radioactive carbon or is substituted with a radioactive halo when R^2 is hydrogen or a non-radioactive halo;

provided that when R^1 is hydrogen or -OH, R^2 is hydrogen and R^4 is $-^{11}CH_3$, then R^3 is C_2-C_6 alkyl, C_2-C_6 alkenyl or C_2-C_6 alkynyl; and

further provided that when R^1 is hydrogen, R^2 hydrogen and R^4 is $-CH_2CH_2CH_2{}^{18}F$, then R^3 is C_2-C_6 alkyl, C_2-C_6 alkenyl or C_2-C_6 alkynyl.

2. The compound of claim 1, wherein:

R^1 is hydrogen, -OH, -CN, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_1-C_6 alkoxy or halo;

R^2 is hydrogen; and

R^4 is C_1-C_6 alkyl, C_2-C_6 alkenyl or C_2-C_6 alkynyl, wherein the alkyl, alkenyl or alkynyl comprises a radioactive carbon.

3. The compound of claim 2, wherein:

R^1 is hydrogen, -OH, -CN, $-OCH_3$, $-CH_3$ or -Br; and

R^3 is hydrogen or $-CH_3$; and

R^4 is $-{}^{11}CH_3$.

4. The compound of claim 1, wherein:

R^2 is a non-radioactive halo or a radioactive halo, wherein the halo is iodo; and

R^4 is hydrogen, C_1-C_6 alkyl, C_2-C_6 alkenyl or C_2-C_6 alkynyl, wherein the alkyl, alkenyl or alkynyl comprises a radioactive carbon when R^2 is a non-radioactive halo.

5. The compound of claim 4, wherein:

R is $-CH_3$; and

the radioactive carbon in R^4 is ^{11}C.

6. The compound of claim 5, wherein:

R^1 is –OH or C_1-C_6 alkoxy;

R^2 is a radioiodine; and

R^3 and R^4 are independently hydrogen or C_1-C_6 alkyl.

7. The compound of claim 6, wherein:

R^1 is –OH;

R^2 is $-^{123}I$ or $-^{125}I$; and

R^3 and R^4 are each hydrogen.

8. The compound of claim 1, wherein R^2 is a radiofluoro.

9. The compound of claim 8, wherein:

R^1 is –OH or C_1-C_6 alkoxy;

R^2 is ^{18}F; and

R^3 and R^4 are independently hydrogen or C_1-C_6 alkyl.

10. The compound of claim 9, wherein:

R^1 is –OH;

R^3 is hydrogen; and

R^4 is $-CH_3$.

11. The compound of claim 1, wherein R^4 is C_1-C_6 alkyl, C_2-C_6 alkenyl or C_2-C_6 alkynyl, wherein the alkyl, alkenyl or alkynyl is substituted with a radioactive halo.

12. The compound of claim 11, wherein:

R^1 is –OH or C_1-C_6 alkoxy;

R^2 is hydrogen;

R^3 is hydrogen or C_1-C_6 alkyl; and

R^4 is C_1-C_6 alkyl substituted with ^{18}F.

13. The compound of claim 12, wherein:

R^1 is –OH;

R^3 is hydrogen; and

R^4 is $-CH_2CH_2CH_2{}^{18}F$.

14. A pharmaceutical composition comprising

(i) an effective amount of a compound of claim 1; and

(ii) a pharmaceutically acceptable carrier.

15. A method for detecting amyloid deposit(s) *in vivo*, comprising:

(i) administering to a mammal an effective amount of a compound of claim 1, wherein the compound would bind any amyloid deposit(s) in the mammal; and

(ii) detecting binding of the compound to amyloid deposit(s) in the mammal.

16. The method of claim 15, wherein the amyloid deposit(s) is/are located in the brain of the mammal.

17. The method of claim 15, wherein the mammal is a human who is suspected of having Alzheimer's disease, familial Alzheimer's disease, Down's syndrome, Mild Cognitive Impairment or homozygotes for apolipoprotein E4 allele.

18. The method of claim 15, wherein the detecting is effected by gamma imaging, magnetic resonance imaging or magnetic resonance spectroscopy.

19. The method of claim 18, wherein the detecting is effected by gamma imaging.

20. The method of claim 19, wherein the gamma imaging is PET or SPECT.

21. The method of claim 15, wherein the compound is administered intravenously.

22. A method for detecting amyloid deposit(s) *in vitro* comprising:

(i) contacting a bodily tissue with an effective amount of a compound of claim 1, wherein the compound would bind any amyloid deposit(s) in the tissue; and

(ii) detecting binding of the compound to amyloid deposit(s) in the tissue.

23. The method of claim 22, wherein the compound is in a solution that further comprises 25-99% ethanol, with the remainder of the solution being water.

24. The method of claim 23, wherein the solution comprises 0-50% ethanol and 0.0001 to 100 μM of the compound.

25. The method of claim 22 wherein the detecting is effected by bright-field, fluorescence, laser-confocal or cross-polarization microscopy.

26. The method of claim 22, wherein the method further comprises:

(iii) separating from the tissue the amyloid deposit(s) bound to the compound; and

(iv) quantifying the amyloid deposit(s) bound to the compound.

27. A method for distinguishing an Alzheimer's diseased brain from a normal brain comprising:

(i) obtaining tissues from (i) the cerebellum and (ii) another area of the same brain, of a normal mammal and of a mammal suspected of having Alzheimer's disease;

(ii) contacting the tissues with a compound of claim 1;

(iii) quantifying the amyloid bound to the compound;

(iv) calculating the ratio of (a) the amount of amyloid in the area of the brain other than the cerebellum to (b) the amount of amyloid in the cerebellum;

(v) comparing the ratio for a normal mammal with the ratio for a mammal suspected of having Alzheimer's disease.